



# MOVING TO A CLOUD PHONE SYSTEM AND UCAAS:

A Guide for Business Leaders

**RingCentral**<sup>®</sup>

# Where collaboration and communications technology is headed

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More than half of businesses are expected to adopt cloud unified communications as a service (UCaaS/hosted PBX) by 2020, surpassing premises-based PBX.<sup>1</sup> This reflects a shift to the cloud by businesses of all sizes for their communications and collaboration solutions.

Whether you're considering deploying a new system or upgrading an existing one, you probably have a number of questions about UCaaS vs. other more traditional technologies and what to expect if you deploy a cloud solution. This guide provides answers to the most common questions customers have and gives an overview of your choices when it comes technology platforms—PBX, IP PBX, and cloud.

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*51% of businesses are expected to adopt cloud unified communications (UCaaS/hosted PBX) by 2020.<sup>1</sup>*

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# PBX, IP PBX, or cloud UCaaS: Which one is right for your business?

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Today, businesses have a number of choices when it comes to telecom technology.

## **PBX**

A PBX (public branch exchange) is a telephone switching system that manages incoming and outgoing calls for a company's internal users.

So why would you need a PBX? Imagine you have 200 employees in your organization. They all work from the office, and they all need to call their customers and partners, as well as their coworkers.

Without a PBX, you would need 200 analog trunk lines from a telecom service provider to provide telephone access to all your employees. Plus, when they call one another, those calls are charged as if they are routed from the public telephone exchange.

**The PBX system addresses this obviously impractical scenario by serving two purposes:**

- 1 Sharing trunk lines:** Because not all employees make calls all the time, you can procure a trunk line from the telco and share perhaps 10 of its lines for 10 employees. The PBX manages this sharing.
- 2 Routing calls:** This allows employees to make internal calls—based on dialing extension numbers—without charge. The PBX works like a miniature version of the switching system at a public telephone exchange, except it routes calls from one extension to another extension internally.



The PBX is also connected to the public switched telephone network (PSTN) and automatically routes incoming calls to specific extensions. A typical PBX system in a small to medium-sized business includes hard-wired phone lines, a computer server that manages call switching and routing, and a console for manual administration and control.

This is the traditional business phone system, and it provides a familiar, stable, and durable service. Unfortunately, it requires a significant up-front investment in hardware. The complexity of the hardware and building wiring also makes it difficult to make changes, such as moving, adding, changing, or deleting users (MACD). Plus, you need to have someone (either your staff or a third party) with PBX and telephony expertise to manage and support the system.

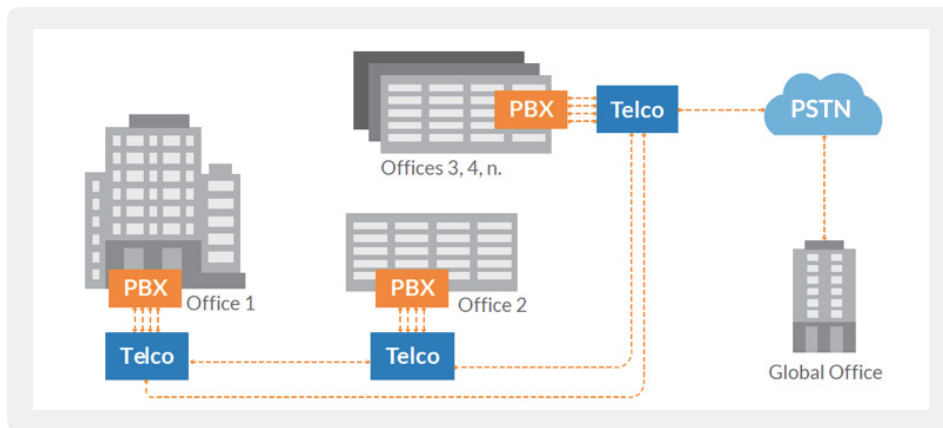
Traditional PBX systems are also limited to voice functionality, which puts a ceiling on adopting new technologies such as HD video conferencing or collaboration software. Businesses with multiple locations will also need a PBX at each location and telco connectivity between locations. Additionally, employees in one location may not be able to direct extension-dial coworkers in other locations, and customers may not be able to reach an employee from a main company number.





# PBX connectivity

The diagram below shows how a PBX connects to the public telephone network with multiple analog trunk lines, as well as the telco connections—and the respective telco relationships—necessary to connect multiple business locations. Note that each site requires PBX hardware as well as local maintenance of the hardware and software. In addition, since the PBX architecture was originally designed to route calls within a building and to and from the PSTN, it does not support mobile or remote workers.





# IP PBX

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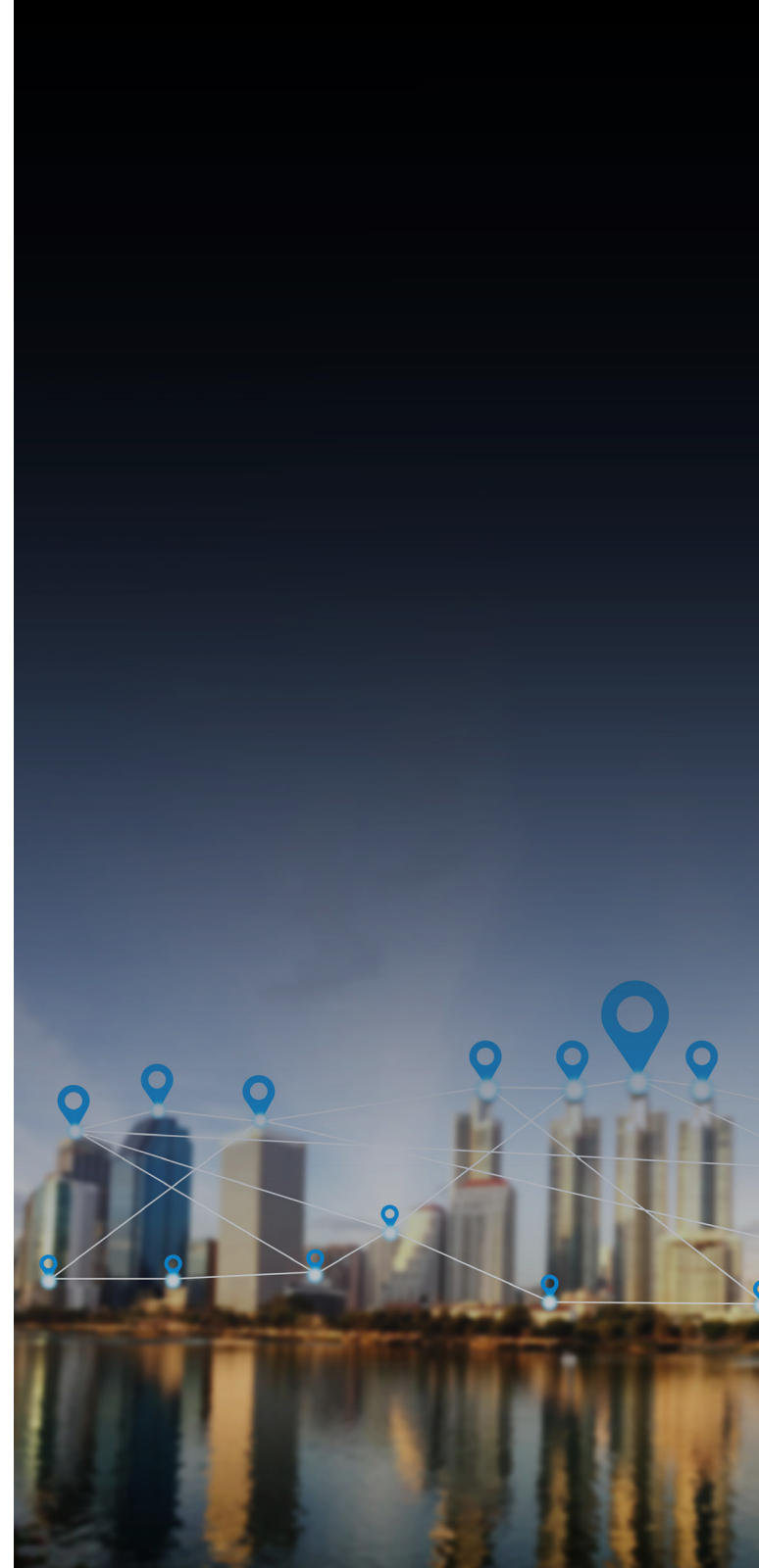
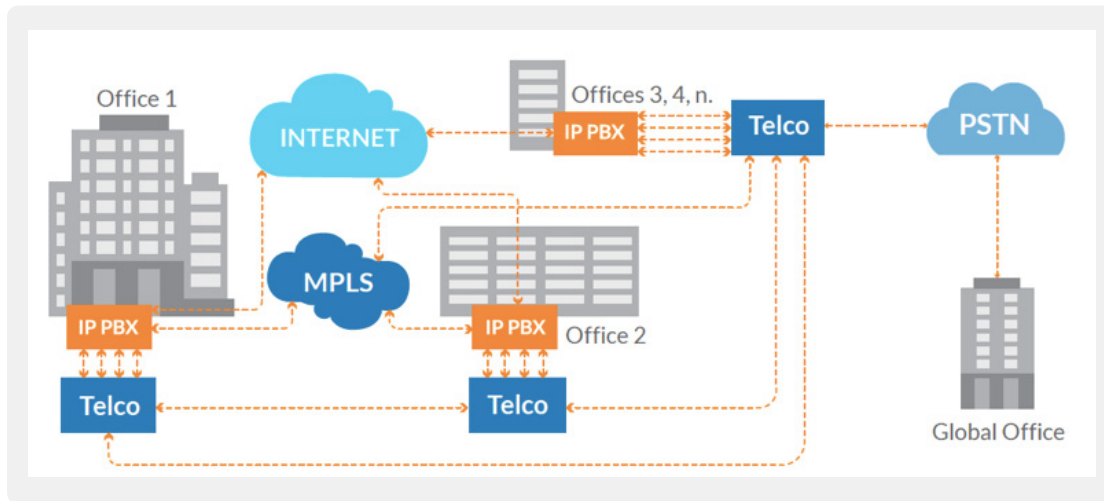
An IP PBX is similar to a traditional PBX except it runs on an internet protocol (IP) data network. This allows it to perform the switching and connecting of voice over IP (VoIP) as well as conventional landline calls. A PBX connects to the PSTN via conventional trunk lines, but an IP PBX routes calls via SIP trunking, which uses the internet and eliminates the physical connection to a phone company.

An IP PBX system works much like the familiar PBX system while offering several advantages. In addition to landline phones, you can use IP phones and softphones. Also, a conventional PBX requires two networks, one for data and another for voice. But an IP PBX system runs on an IP data network and SIP trunking, which reduces costs and minimizes network management while offering slightly better scalability.

However, an IP PBX shares some of the disadvantages of a traditional PBX. It still requires a substantial investment in hardware, is limited to voice functionality, and has a ceiling on deploying new technologies. These systems also require on-site expertise, and the complexity of the hardware makes MACD slow. And although the connectivity between multiple business locations is less expensive, you still have the cost and complexity of hardware and support at each location.

# IP PBX connectivity

The diagram below shows how an IP PBX not only connects to telcos for traditional analog voice calling but also integrates with the internet and IP telephony (VoIP) features and functions. However, similar to PBX, it relies on telco connectivity to connect multiple locations, and it is not designed to support mobile or remote workers. IP PBX systems are also needed at each location—along with the associated capex, maintenance, and upgrade costs.





# UCaaS

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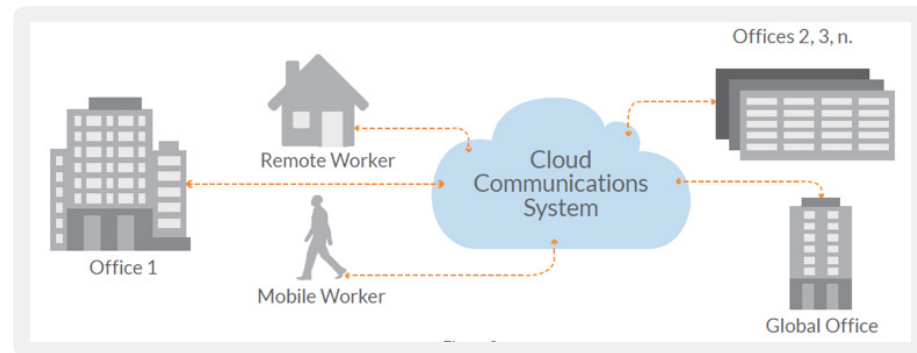
Today's small and medium-sized businesses require specialized features and unified communications capabilities to support their particular workflows. UCaaS combines reliable, high-quality voice calling with features that traditional PBX and IP PBX phone systems can't deliver. A mature cloud UCaaS solution, like RingCentral Office®, also integrates with common business apps and new collaboration tools. Additionally, moving business communications to the cloud not only eliminates the cost and complexity of on-site hardware but also enhances collaboration, improves productivity, and more.

UCaaS also reduces the cost and complexity of connecting to telcos and between locations. Users connect directly to the cloud system via the internet—either “over the top” or using a dedicated private network (MPLS) from a telco or an end-to-end UCaaS provider like RingCentral. This approach dramatically reduces communications and network management costs.

Also with UCaaS, virtually anyone—without the need for specialized telephony or PBX knowhow—can move, add, change, or delete lines and administer the system from a web-based dashboard.



# UCaaS connectivity



For businesses with multiple locations, the cloud UCaaS architecture inherently eliminates not only the investment in PBX hardware at each location but also the cost and complexity of enabling connectivity between them. It further provides the benefits of a completely integrated phone system across multiple locations, such as the ability to transfer calls or dial coworkers using extension numbers.

# Types of internet connections and bandwidth requirements for high quality of service with UCaaS

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Since the voice component of a UCaaS system like RingCentral Office uses IP-based technology, all calls traverse your internet connection to the cloud (for call processing/routing), and then on to the destination network or phone. Therefore, the quality of your business communications depends on quality of service (QoS), which is the ability of a communications network to perform consistently and reliably.

Guaranteeing QoS is imperative for delivering reliable business communications over the internet. In a VoIP call, for example, the sound of your voice (and the other caller's voice) is converted into thousands of packets. Many factors can affect the packet transport, impacting call quality. The three most common factors are latency, jitter, and packet loss.

## **Latency**

Latency (also known as delay) refers to the time it takes a voice packet to reach its destination. Packets may take longer to reach their destination because they get held up in long queues, or take a less direct route to avoid congestion. Latency is measured in milliseconds (ms), or thousandths of a second. Latency of 150 ms or less (one way)





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is generally acceptable. Latency greater than 150 ms (again, one way) adversely affects the call quality experience. In some cases, excessive latency can render an application such as VoIP or video conferencing unusable.

## **Jitter**

Packets traveling over the internet will reach their destination with delays, which vary according to their position in the queues of the routers along the path between source and destination. This variation in delay (called jitter) can seriously affect the quality of streaming audio and video. Jitter is measured in milliseconds (ms), or thousandths of a second. Jitter greater than 30 ms may result in packet drops, which will impact call-quality experiences.

## **Packet loss**

Packets are sent over the internet and reassembled at their destination. Network routers will drop some packets if the data is corrupted or arrives when the router buffers are full. The receiving end may ask for retransmission of the dropped packets, possibly causing severe delays in the overall transmission. The effects of this data loss may be missing syllables or even missing words during a conversation.

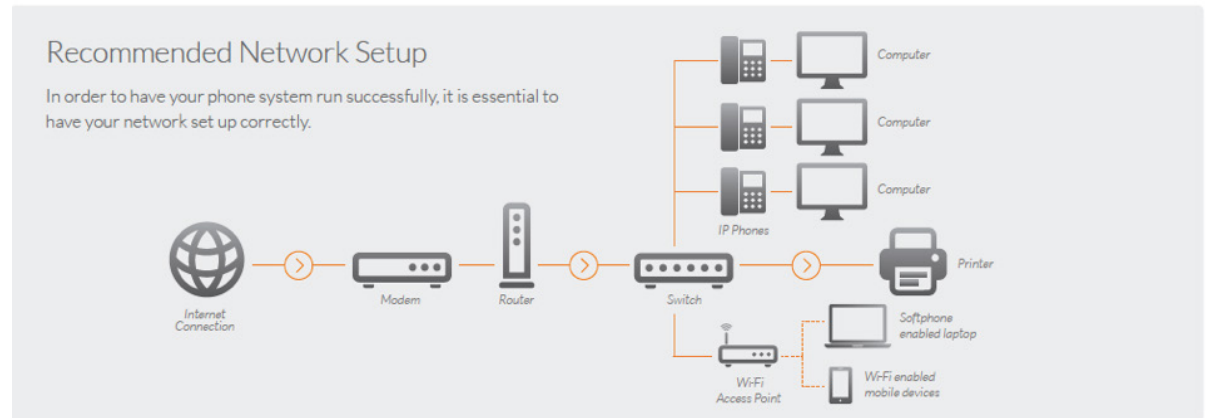
Ensuring optimal voice and video quality requires a stable internet connection that provides consistent performance. RingCentral recommends that you have a high-speed DSL, cable, or fiber connection with enough bandwidth to accommodate both your regular internet traffic and the number of simultaneous voice calls. A connection with a business service level agreement (SLA) is preferred but not required.

RingCentral calls require 92 Kbps per active phone call (or 100 Kbps/call, for ease of calculation; via G.711 or G.722). A speed test can be performed via [speedtest.net](https://www.speedtest.net) to confirm your bandwidth. Internet connections in most areas typically are sufficient for the service. Lower bandwidth options are available if needed, though are not recommended.



# Setting up your network for onboarding to your UCaaS provider

Getting ready for VoIP and IP video and connecting RingCentral to your network will involve a few different elements, most of which you likely already have.



This diagram depicts the network components involved and the process when you connect your location to your ISP (internet service provider). The internet first connects to your modem and then goes to your router. After that, it passes through your firewall (if you have one) and then to your switch. Finally, the switch connects your phones, computers, Wi-Fi router, etc., to the UCaaS system. Your hardware may be a variation of this setup. RingCentral can help assess your specific network needs.

# Ensuring adequate network capacity (available bandwidth)

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Internet traffic issues, such as latency and jitter, do not impact services like email or web browsing. For instance, even if the packets arrive late, they will be reassembled in a buffer in microseconds, and the email recipient will not notice any impact from the delay. However, with real-time applications like VoIP, jitter, packet loss, and latency can reduce quality or even render a service unusable.

For this reason, when moving to UCaaS, there are some simple network readiness considerations. A primary consideration is making sure you have a QoS-enabled router that prioritizes voice traffic over lower-priority data traffic, such as large downloads. [\[link to list of recommended QoS routers\]](#).

## Capacity

Due to varying demands from different users sharing network resources, the bit rate that can be provided to a certain data stream may be insufficient for real-time multimedia services if all data streams get the same scheduling priority.

By applying QoS mechanisms, network administrators can employ network resources efficiently without reactively expanding or overprovisioning their networks and can better manage the required level of service. This may include prioritizing VoIP and IP video traffic over bandwidth-hungry but less time-sensitive traffic.

RingCentral manages QoS at the firewall and router level by either partitioning or prioritizing bandwidth. Partitioning bandwidth reserves and sets aside a certain amount of your bandwidth as a whole and dedicates it to RingCentral's voice services only. Prioritizing bandwidth ensures that in instances of high bandwidth use, voice traffic will maintain optimal speed, but the router and firewall will slow down bandwidth being used for other things, such as streaming video.



# Mobile readiness and Wi-Fi

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RingCentral Office is fully available on Android™ and iOS® devices via our free mobile apps. Users enjoy a complete UCaaS experience on a mobile device, using either Wi-Fi or the device's cellular data connection.

Mobile users can make calls, take calls, IM, video chat, share screens, use team messaging, and manage their system from their mobile device. Any function available to users at their desks is also available on a mobile device.

Calls made on Wi-Fi connections will not take away from the data plan of the mobile device, while calls made over the device's data connection will take away from the pool of data. Voice requires very little data and is typically negligible. Callers are also able to use their carrier service instead of their data plan, which avoids using the data plan of the device.

## **Wi-Fi vs. stable cable**

Your employees can use Wi-Fi on their mobile devices or on a softphone on their personal computer to connect to the internet. While they may often experience optimal call quality over Wi-Fi, much is outside your span of control when employees are connected via Wi-Fi. Wi-Fi connections can be significantly impacted by the number of users on the network, the distance from the router, and other factors.

It is rare that mobile workers will have connectivity issues—such as many users on a single Wi-Fi network—while traveling. However, in an office environment, it is always recommended to use a direct connection into the LAN (router) for the most stable connection. This allows you to prioritize your bandwidth so that your VoIP users will always have a consistent and stable connection.

# Benefits of unified communications

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Small and medium-sized business will notice some immediate impacts of moving to a UCaaS solution. First, it integrates all of your communications and collaborations solutions into a single platform. For example, the RingCentral Glip® team-messaging application can link to the same features and user base as your phone system. This allows users to quickly invite other team members to a group chat, and then escalate the meeting to a video conference with one click if the team might benefit from the shift.

## **Business benefits**

You'll also see concrete business benefits like better support from a single vendor, faster MACD, and more seamless integration between contact center software and the phone system. A single platform for all your communications and collaboration can also provide better business intelligence, such as reports to let managers view the performance of telemarketers. And an open platform gives you the ability to grow revenue and improve productivity by embedding calling features into workflows and business applications. You can also leverage investments in existing phones and other hardware, because RingCentral is based on open standards and is operating-system agnostic. Plus, because all infrastructure is housed in remote data centers, a cloud UCaaS system is inherently resilient to local outages and natural disasters.



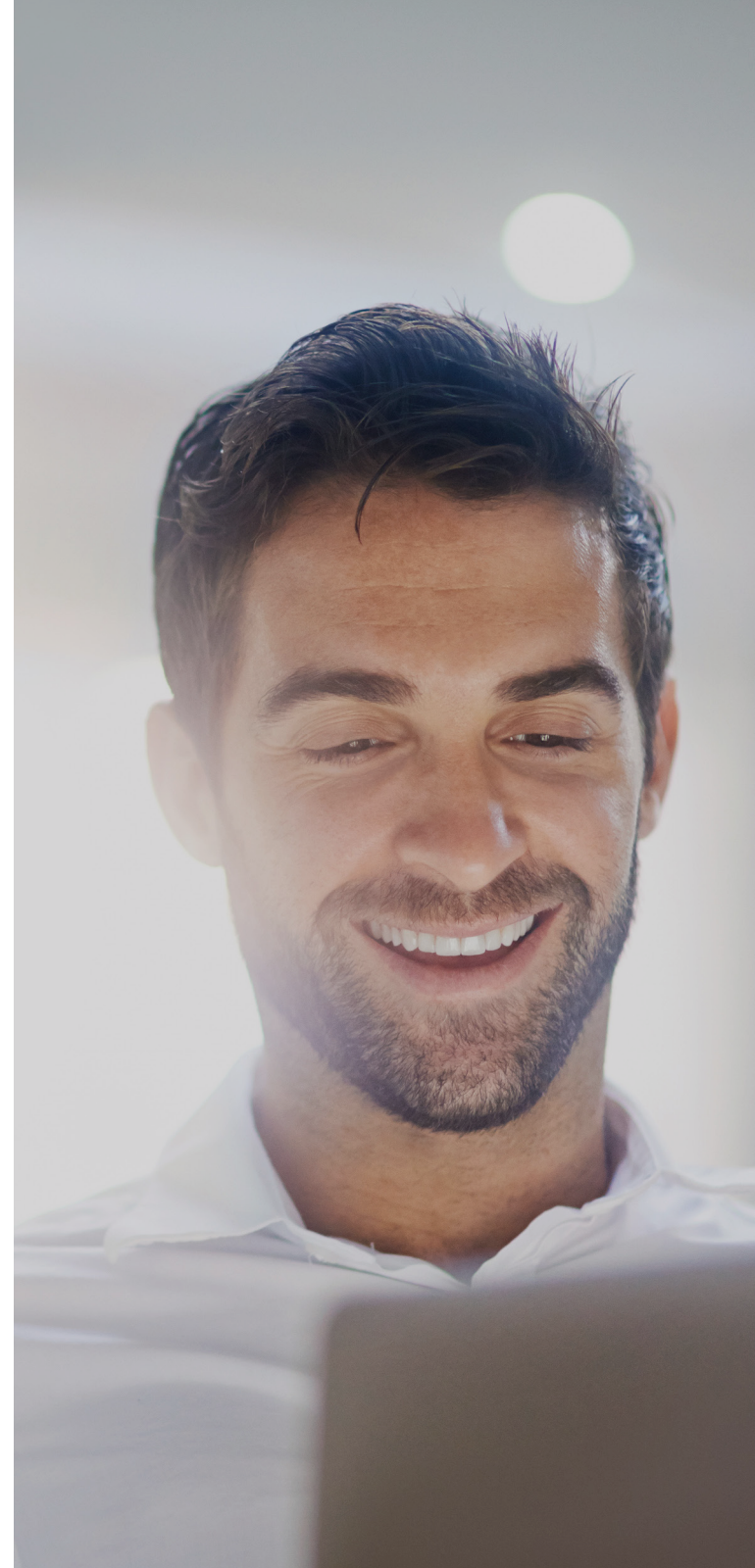
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## User benefits


The workplace is changing, and the need for collaboration, mobility, and efficiency is greater than ever. A UCaaS solution like RingCentral Office provides a single ecosystem for all of your communications and collaboration needs. Users can reach coworkers and team members more easily and share real-time collaborative workspaces—no matter where they are. With more immersive collaboration enabled by HD video conferencing, teams can make better decisions, faster. Salespeople can work more efficiently with calling features integrated directly into the Salesforce® user interface. Mobile workers can join a voice conference or web meeting with one touch on their smartphone screen.

## Greater customer satisfaction

All of this translates into a better experience for the customer when they interact with your company. They can reach your employees from a single business number for phone, fax, and text. And when your employees call or text a customer from a mobile device, the customer sees the business number. Employees can directly transfer a customer's call to the right person in another location. Contact center agents can bring up the customer's information instantly or bring an expert on to a support call. Or, using calling and texting functionality integrated into your custom mobile apps, you can let the customer know when your representative will arrive at their location.







# RingCentral is the industry leader in cloud communications and collaboration

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The most important step in transitioning to UCaaS is choosing the right service provider. For three consecutive years, respected analyst firm Gartner has named RingCentral a Leader in its Magic Quadrant for Unified Communications as a Service, Worldwide. RingCentral has more than 350,000 global customers and owns and controls a robust global network backbone and has established relationships with leading Tier 1 local carriers and ISPs around the world.

The RingCentral UCaaS platform is the result of 15 years of research and development, and it offers industry-leading reliability and QoS. It also offers a comprehensive set of features, including Business SMS and MMS, fax, web meetings, audio and HD video conferencing, team messaging, and a mobile app—all for one inclusive monthly service fee. RingCentral business users also benefit from a number of integrations with key business productivity applications, including Salesforce®, Microsoft Office 365™, and Google. RingCentral is also a Tier 1 Google partner and trusted advisor to European enterprises across 17 countries.

Additionally, RingCentral is the only open UCaaS platform, offering customers access to source code, open APIs, and SDKs to make it fast and easy to create custom integrations.

# Making the switch to RingCentral

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Making the switch between providers can seem intimidating, but RingCentral makes the process as seamless and risk-free as possible. This transition support includes assigning a dedicated implementation advisor who assists you in the process.

## Key transition items

**Number porting:** As a local exchange carrier (LEC), RingCentral can facilitate porting between your existing provider and the RingCentral cloud service on your behalf. During service setup, the RingCentral team assigns temporary numbers to get the system up and running. RingCentral also works with you to get the appropriate information and documentation in place to ensure the port takes place effectively and with a goal of zero downtime. Once the port is approved, you choose a port date and time. When that moment arrives, the temporary numbers will disappear and your numbers will port to RingCentral, at which point you will be 100% on the RingCentral cloud UCaaS platform.



# Moving or setting up a new office

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With a PBX or IP PBX, working with a telco carrier to move numbers to a new location or set up a new office can take months. However, with a cloud UcaaS system, you can have a new office up and running in 48 hours. This is a huge benefit for companies with seasonal employees, construction companies that need to quickly set up offices on a job site, or any company that needs agility to capture new markets.

RingCentral also uses plug-and-play phones that call in to the network and provision themselves. This eliminates the need for someone



with IT skills to travel to the location and program desk phones. Getting remote workers connected to the company phone system is as simple as drop-shipping a phone. The remote employee simply plugs the phone into an Ethernet connection, and they are ready to start making calls.



# Leveraging your investment in phones and existing hardware

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RingCentral can re-provision nearly any open SIP standard phone to connect to our servers. To do this, we provide assisted provisioning on many devices and make all other provisioning as easy as possible. This is all managed via the RingCentral online customer portal. You simply assign an “existing device” to a user, and then set up and provision the phone, selecting the make and model of the device from the drop-down menu. At this point, you only need to type in the MAC (media access control) address of the phone (usually located on the back of the phone) and click save. The phone will reboot and will be provisioned to RingCentral.

If a phone is not supported through assisted provisioning, simply log in to the IP address of the device and type in the server information provided in the provisioning tool and save, then reboot the device.





# Glossary of UCaaS and telephony terms

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**Auto attendant:** A virtual receptionist allowing callers to be automatically transferred to an extension without the intervention of an operator

**Codec:** A device or program that compresses data to enable faster transmission and decompresses received data

**DID:** (direct inward dial) A service offered by communications companies to allow a dialed number to directly reach the endpoint associated with the DID

**DSL:** (digital subscriber line) A technology for bringing high bandwidth to homes and small businesses over ordinary copper telephone lines

**Fiber:** High-speed internet service delivered via fiber-optic cable

**Firewall:** A network security system that monitors and controls the incoming and outgoing network traffic based on the predetermined security rules

**GigE:** Applies to various technologies that transmit Ethernet at one gigabit per second

**Hunt Group:** A method of distributing calls from a single telephone number to a group of several phone lines

**Hybrid PBX:** (hybrid private branch exchange) A modified PBX allowing connectivity via the internet

**IP Address:** A unique string of numbers separated by periods that identifies each computer using the internet protocol (IP) to communicate over a network

**ISP:** (internet service provider) An organization that provides internet services

**IVR:** (interactive voice response) A technology that allows a computer to interact with humans using voice and DTMF (dual tone multi-frequency) tones via keypad

**LAN:** (local area network) A computer network that interconnects computers within a limited area such as a residence, school, laboratory, university campus, or office building and has its network equipment and interconnects locally managed

**LEC:** (local exchange carrier) A regulatory term in telecommunications local telephone company

**MAC Address:** (media access control address) A unique identifier assigned to network interfaces

**MACD:** (move, add, change, delete) Orders to make changes to an employee's phone line/services within a company

**MPLS:** (multiprotocol label switching) A type of data carrying for high-performance telecommunications networks, moving data from one network node to the next based on short path labels

**OTT:** (over-the-top) A term referring to media transmitted via the open internet

**PBX:** (private branch exchange) A telephone system within a business location that switches calls between users on local lines and allows users to share phone lines

**PoE:** (power over Ethernet) A system allowing electric power along with data on twisted pair Ethernet cabling

**Porting:** Reassigning phone numbers from one carrier to another

**Port Triggering:** A configuration option on a router that enables a host machine to automatically forward a specific port back to itself

**POTS:** (plain old telephone service) Traditional lines of telephony service in homes and PBX-based business phones

**PRI:** (primary rate interface) A telecommunications standard used on a digital network for carrying multiple voice and data transmissions between the network and a user

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**Provisioning:** The process of preparing and equipping a network or network endpoint such a desk telephone to allow it to provide new services

**PSTN:** (public switched telephone network) The world's collection of interconnected voice-oriented public telephone networks, both commercial and government owned

**QoS:** (quality of service) Refers to the degree to which a communications network can perform in a reliable and consistent manner

**Queue:** A concept used in inbound contact centers using call distribution to send incoming calls to specific resources in the center

**Router:** A networking device that forwards data packets between computer networks, directing functions on the internet

**SD-WAN:** (software defined wide area network) A specific application of software-defined networking (SDN) technology applied to WAN connections, which are used to connect enterprise networks

**SIP:** (session initiation protocol) A communications system of signaling for the purpose of controlling multimedia communications sessions like internet protocol (IP) telephony.

**SIP Trunks:** A VoIP and streaming media service that allows telephone service to communicate with an IP-based PBX (IPPBX)

**Switch:** A device that connects multiple devices together on a computer network

**T1:** A copper-based digital transmission line (While standard telephone lines can only transfer voice and data at 56 kbps using a modem, a T1 line can transmit data at a speed of 1.544 Mbps. Channelized T1 can carry 23 voice calls simultaneously.)

**UCaaS:** (unified communications as a service) A delivery model of communications in which a variety of applications and services—including voice calling—are consolidated and delivered over the internet from a cloud service provider

**VoIP:** (voice over internet protocol) A technology that allows users to make voice calls using a broadband internet connection instead of an analog telephone line

**WAN:** (wide area network) A telecommunications network or computer network that extends over a large geographical distance

<sup>1</sup>2017 BroadSoft: 2nd Annual BroadSoft, Inc. survey of global telecom providers and industry leaders

# About RingCentral

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RingCentral, Inc. (NYSE:RNG) is a leading provider of global enterprise cloud communications and collaboration solutions. More flexible and cost-effective than legacy on-premises systems, RingCentral empowers today's mobile and distributed workforce to communicate, collaborate, and connect from anywhere, on any device. RingCentral unifies voice, video, team messaging and collaboration, conferencing, online meetings, and integrated contact center solutions. RingCentral's open platform integrates with leading business apps and enables customers to easily customize business workflows. RingCentral is headquartered in Belmont, California, and has offices around the world.

Contact Telcom Innovations Group for additional information @ 630-35-0700 or email [info@ask-tig.com](mailto:info@ask-tig.com)

**RingCentral**<sup>®</sup>

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